CLAIMS

1. A method for manufacturing a grain-oriented electrical steel sheet, comprising the steps of:

rolling a steel slab containing 0.08 mass percent or less of carbon, 2.0-8.0 mass percent of Si, and 0.005-3.0 mass percent of Mn into a cold-rolled steel sheet;

subsequently performing decarburizing annealing of the cold-rolled steel sheet if desired;

subsequently applying an annealing separator to the cold-rolled steel sheet if desired;

performing secondary-recrystallization annealing of the cold-rolled steel sheet; and

subsequently performing purification annealing of the cold-rolled steel sheet,

wherein the steel slab contains less than 100 ppm of Al and not more than 50 ppm each of N, S, and Se, the purification annealing is performed at 1050°C or more, and the partial pressure of hydrogen in the atmosphere is adjusted to 0.4 atm or less in a temperature range above 1170°C for a purification annealing conducted at a temperature above 1170°C, or 0.8 atm or less in a temperature range of 1050°C or more for a purification annealing conducted at a temperature of 1170°C or less.

2. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein the steel slab further contains 0.005-1.50 mass percent of Ni and/or 0.01-1.50 mass percent of Cu.

3. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein the steel slab further contains a total of 0.0050-0.50 mass percent of at least one of Cr, As, Te, Sb, Sn, P, Bi, Hg, Pb, Zn, and Cd, and the partial pressure of the hydrogen atmosphere is adjusted to 0.2 atm or less in a temperature range above 1170°C for a purification annealing conducted at a temperature above 1170°C, or 0.6 atm or less in a temperature range of 1050°C or more for a purification annealing conducted at a temperature of 1170°C or less.

4. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein the steel slab further contains a total of 0.0050-0.50 mass percent of at least one of As, Te, Sb, Sn, P, Bi, Hg, Pb, Zn, and Cd, and the partial pressure of the hydrogen atmosphere is adjusted to 0.2 atm or less in a temperature range above 1170°C for a purification annealing conducted at a temperature above 1170°C, or 0.6 atm or less in a temperature range of 1050°C or more for a purification

annealing conducted at a temperature of 1170°C or less.

5. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein, as the annealing separator, a MgO-based annealing separator is applied to the cold-rolled steel sheet.

6. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein the rolling step comprises the substeps of:

hot-rolling the steel slab;

annealing the hot-rolled steel sheet if desired; and

performing cold-rolling one time, or at least two times with intermediate annealing therebetween to produce the cold-rolled steel sheet.

7. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein the nitrogen content in the atmosphere is less than 50% by volume in the purification annealing.

8. The method for manufacturing a grain-oriented electrical steel sheet according to Claim 1, wherein the rolling comprises a cold-rolling substep of preparing a cold-rolled steel strip, and the cold-rolled steel strip is

subjected to the secondary-recrystallization annealing and the purification annealing to produce a strip-shaped grain-oriented electrical steel sheet.

9. A strip-shaped grain-oriented electrical steel sheet manufactured by the method according to Claim 8.

10. A strip-shaped grain-oriented electrical steel sheet containing 2.0-8.0 mass percent of Si, 0.005-3.0 mass percent of Mn, and 35 ppm or less of N, prepared through a finishing-annealing and a flattening step, wherein the number of bendings in accordance with JIS C 2550 is at least 6 over the transverse direction.